UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

WASTE MANAGEMENT DIVISION
RCRA ENFORCEMENT SECTION
RCRA COMPLIANCE EVALUATION INSPECTION REPORT

Purpose:	RCRA Compliance Evaluation Inspection
Facility Location:	Metco Metal Finishing, Inc. 3508 East Corona Ave. Phoenix, AZ 85040-2842
U.S. EPA ID Number:	AZD 982 486 169
Date of Investigation:	March 20, 2001
U. S. EPA Investigators:	Kaoru Morimoto Environmental Engineer (415) 744-2143 Morimoto.Kaoru@epa.gov Robin Holloway Environmental Protection Specialist (415) 744-2043 Holloway.Robin@epa.gov
Arizona Department of Environmental Quality Inspector:	Carol Hibbard Compliance Officer (602) 207-4114 Hibbard.Carol@ev.state.az.us
Facility Representative:	Mark C. Williams Technical Director (602) 276-4120
Report Prepared By:	Robin Holloway
Report Date:	April 12, 2001

FACILITY BACKGROUND

Metco Metal Finishing, Inc. (hereafter referred to as "Metco" or "the facility") is located at 3508 East Corona Avenue, Phoenix, Arizona. The facility has been in business at the site since 1990 and employs approximately fifty people. The facility is 13,500 square feet and operates five days, thirty-six hours a week.

Metco is an independent metal finishing job shop. Metal finishing is a general industry practice used to harden metal parts and protect them from corrosion, and may also be used for aesthetic reasons. Metco finishes parts that are supplied by a variety of other companies (such as technology businesses, automotive parts manufacturers, machine shops, etc.). The metal parts are most often composed of aluminum, steel, copper, and brass. The facility has five primary processes: (1) copper, tin and electroless nickel plating; (3) zinc plating; (3) anodizing and "chem film" chromate coating; (4) zinc phosphate; and (5) bright nickel.

Prior to the actual finishing, the metal surfaces of the parts are cleaned with an alkaline cleaning solution and/or acid cleaning. Parts are then dipped into the metal-ion-bearing aqueous solutions used in the plating tanks. Parts are typically rinsed between and after each of these operations. The majority of RCRA waste produced by the facility is spent alkaline and acid cleaners and plating baths. The cleaners are changed every 3-6 months and the spent plating baths are emptied only once or twice a year. Both are placed in 275-gallon totes and shipped offsite. The facility also generates wastes from black dye used on anodized parts, which are also placed in totes and shipped offsite. Spillage may be either placed in totes for shipment or treated in the wastewater treatment system, depending on the amount and location of the spill. Approximately fifteen totes of wastes are shipped 2-3 times per month. An in-house database was developed to track waste and ensure that hazardous waste shipments were maximized.

Used rinse waters are hard piped to the facility's existing wastewater treatment system. Treated rinse waters are then discharged to the sewer at approximately twenty gallons per minute. Sludges (F006, F019, D007) from the treated wastewater are shipped to US Filter for treatment 4-6 times a month. (A new system using ceramic membrane technology will treat rinses in the future. It has been permitted, but was not yet operational at the time of the inspection. The facility hopes the new system will allow them to re-use up to 25% of their rinse waters.)

REGULATORY HISTORY

The facility submitted a Notification of Hazardous Waste Activity as a small quantity generator of hazardous waste in April 1990. Hazardous wastes identified on the notification form were F006 (wastewater treatment sludges from plating) and F019 (wastewater treatment sludges from chemical conversion coating). A subsequent notification submitted in November 1991 identified the facility as a large quantity generator, and added the following wastes: F001(spent halogenated solvents), F009 (spent solutions from electroplating), D007 (chromium), D008 (lead), and D000 (toxic) (see Attachment 2). At the time of the inspection, the facility was a large quantity generator of hazardous waste. They filed a Biennial Report in 1997 and 1999. A review of ADEQ's Hazardous Waste Subsystem Manifest Details report indicates that the facility ships large amounts of D002, D006, D007, D008, F006, and F019 waste.

The facility was last inspected by ADEQ in 1994. There is no record of this facility being inspected EPA prior to the March 20, 2001 inspection. In 1998, the facility participated in a Pollution Prevention project to extend electroless nickel bath life using electrodialysis (Attachment 3). The facility demonstrated a significant cost savings from reduced electroless nickel chemical use, liquid waste disposal, and rejection of parts.

INVESTIGATION

The purpose of the investigation was to determine Metco's compliance with any and all applicable federal environmental statutes and regulations, and in particular, the Resource Conservation and Recovery Act ("RCRA"), as amended, the regulations provided in the Code of Federal Regulations ("CFR"), Chapter 40, Parts 261-265, 268 and 279, and Arizona's authorized hazardous waste program in the Arizona Revised Statutes, Title 49 and the Arizona Administrative Code, Title 18, Chapter 8, Article 2.

On March 20, 2001, Kaoru Morimoto and Robin Holloway, representing the U.S. Environmental Protection Agency (EPA), conducted an unannounced site investigation at the Metco facility (EPA ID Number AZD 982 486 169) located at 3508 East Corona Ave., Phoenix, Arizona, 85040. The EPA inspectors were accompanied by Carol Hibbard, Compliance Officer for the Hazardous Waste Inspections & Compliance Unit for the Arizona Department of Environmental Quality. Upon providing introductions and credentials, the inspectors contacted Mr. Mark Williams, the Technical Director. The inspectors explained that this was a routine inspection to determine whether or not the facility was in compliance with federal and state regulations concerning the proper management of hazardous wastes. The inspection would consist of a walk-through of those areas of the facility where hazardous waste and used oil were handled, followed by a record review and a post-inspection outbriefing. In the course of the pre-briefing, the inspectors provided the Metco representative with a copy of the Small Business Regulatory Enforcement Fairness Act (SBREFA) Information Sheet.

WALK-THROUGH INSPECTION

Plating Lines and Wastewater Treatment Areas

The inspectors walked through the interior of the plant, noting the wastewater discharge area (photo #1), the weir box, the plating lines (photo #2), and the wastewater treatment system. Each plating area had a separate dike for containment. No hazardous wastes were observed.

Chemical Storage / 90 Day Storage Area

Approximately 30 totes were located in this area. Some were empty, and others contained varying amounts of wastes. The facility's in-house database tracks wastes as they are placed in the area (Attachment 4). According to Mr. Williams, the transporter picks up totes with waste and leaves empty totes on the same run. Because of limited space, both empty and waste-containing totes are stored in the same place. There was little aisle space around the totes. (Photos #3, #4) All twenty-three totes containing wastes had the required labeling. There was a fire extinguisher in the immediate area. The closest phone was located around the corner in the shipping area and would not be immediately accessible in the event of an emergency. No eye

wash was in the area.

Chemical Storage / Satellite Accumulation Area

Adjacent to the 90 day storage area were four 55-gallon drums containing paint waste, fluorescent bulbs, and caustic solution (Photo #5). The drums were properly labeled. No violations were noted.

RECORDS REVIEW

Manifests

The facility maintained signed copies of manifests for offsite shipment of hazardous waste for three years. Manifests were reviewed by the ADEQ inspector for 1999 and 2000. Review of the manifests indicates that the facility is currently a large quantity generator and that US Filter in Los Angeles was the recipient of the most of the waste. No potential violations were observed during the review.

Biennial Report (BRS)

The BRS report for 1999 was reviewed. No violations were noted.

Land Disposal Restriction (LDR) Notifications

LDR Notifications were available. No violations were noted.

Training Plan

The training records included a training plan, a list of which employees needed which training, job titles, position descriptions, and documentation of training provided. As an example, Mr. Williams provided a copy of the "Hazardous Communication, PPE, and Emergency Response" handout used during the refresher training required for all personnel (Attachment 5). The list of employees and their job titles in the training plan did not match the job titles given on the position descriptions. In a letter dated April 5, 2001, Mr. Williams submitted an updated list of job titles that matched the training records and training plan (Attachment 6).

Contingency Plan

The name, address and phone numbers of the emergency coordinator were available at the time of the inspection, as were the evacuation plan, contingency plan, list, description and locations of emergency equipment and arrangements with local agencies. The list of alternate emergency coordinators included the name of a person no longer at the facility. In a letter dated April 5, 2001, Mr. Williams submitted an updated emergency contact list (Attachment 6).

Inspection Records

The weekly inspection log was reviewed for calendar year 2001. No violations were noted.

POTENTIAL RCRA VIOLATIONS

AAC Title 18 and 40 CFR Regulations

1. Failure to Have Adequate Aisle Space

R18-8-262.A
40 CFR §262.34(a)(4)

Generators may accumulate hazardous waste on-site for 90 days or less without a permit or grant of interim status provided that the generator complies with the requirements in Subpart C in 40 CFR Part 265.

R18-8-265.A and §265.35 (Subpart C) require that the owner or operator maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency.

Field Inspection Observations: The thirty 275-gallon totes in the 90 day storage area were not separated by adequate aisle space.

Action Taken by the Facility: In a letter dated April 5, 2001 (Attachment 6), Mr. Williams stated that a new waste treatment system is expected to reduce the use of totes and allow for adequate aisle space in the 90 day storage area.

2. Failure to Have an Emergency Communication Device

R18-8-262.A
40 CFR §262.34(a)(4)

Generators may accumulate hazardous waste on-site for 90 days or less without a permit or grant of interim status provided that the generator complies with the requirements in Subpart C in 40 CFR Part 265.

R18-8-265.A and §265.34(a) (Subpart C) require that whenever hazardous waste is being handled, all personnel involved in the operation must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee.

Field Inspection Observations: There was no communication device in the 90-day storage area. The nearest phone was in the shipping area, inside the building.

Action Taken by the Facility: In a letter dated April 5, 2001, Mr. Williams documented the purchase of an alarm button and horn. According to the letter, appropriate training will be conducted once the alarm is installed.

3. Failure to Maintain Complete Training Records

R18-8-262.A
40 CFR §262.34(a)(4)

A generator may accumulate hazardous waste onsite for 90 days or less without a permit or grant of interim status provided that he complies with §265.16.

R18-8-265.A and §265.16 states that the owner or operator shall maintain the following documents and records at the facility: (1) the job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job; (2) a written job description for each position listed under subsection (d)(1); (3) a written description of the type and amount of both introductory and continuing training that will be given to each person filling a position listed under subsection (d)(1); and (4) records that document that the training or job experience required under subsections (a)(b) and (c) of this section has been given to, and completed by, facility personnel.

Record Review: The list of employees and their job titles in the training plan did not match the job titles given on the position descriptions.

Action Taken by the Facility: In a letter dated April 5, 2001, Mr. Williams submitted an updated list of job titles and employee names that matched the training records and training plan.

4. Failure to Maintain an Up to Date Contingency Plan

R18-8-262.A
40 CFR §262.34(a)(4)

Generators may accumulate hazardous waste on-site for 90 days or less without a permit or grant of interim status provided that he complies with the requirements in Subpart D in 40 CFR Part 265.

R18-8-265.A and §265.52(d) (Subpart D) require that the contingency plan must list names, addresses, and phone numbers of all persons qualified to act as emergency coordinator and this list must be kept up to date.

Record Review: The list of alternate emergency coordinators included the name of a person no longer at the facility.

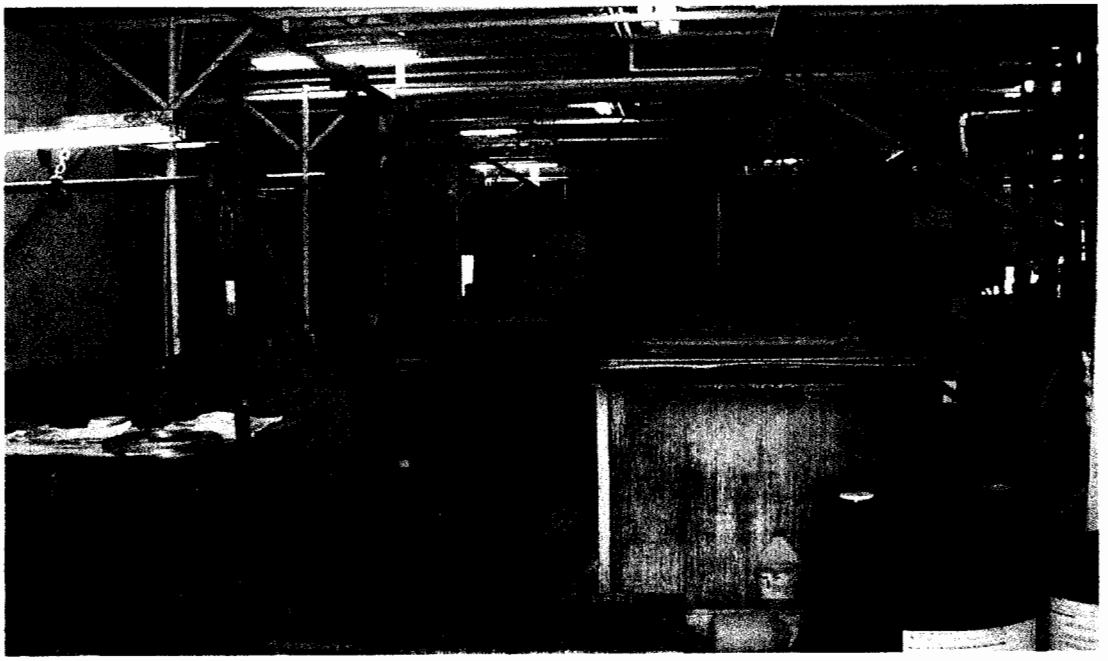
Action Taken by the Facility: In a letter dated April 5, 2001, Mr. Williams submitted an updated emergency contact list.

Attachments

1. Photos
2. 1990 and 1991 Notifications of Hazardous Waste Activity
3. Pollution Prevention Project Fact Sheet
4. Inventory of Wastes on Hand 3/20/2001
5. Training Handout
6. Letter dated April 5, 2001 from the Facility

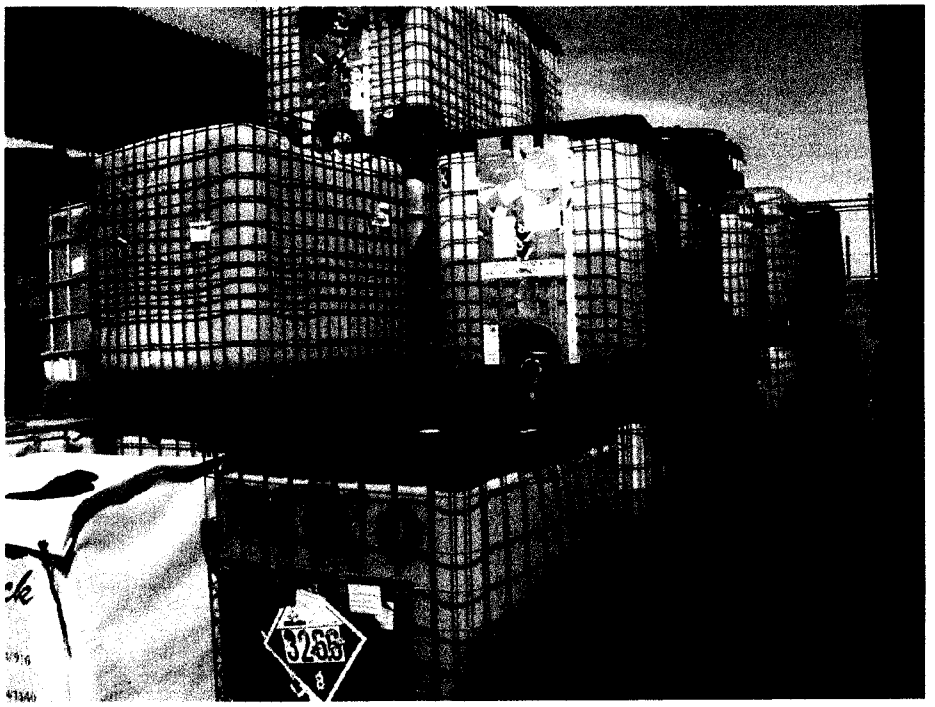
Attachment 1

1. Wastewater Treatment System's discharge area

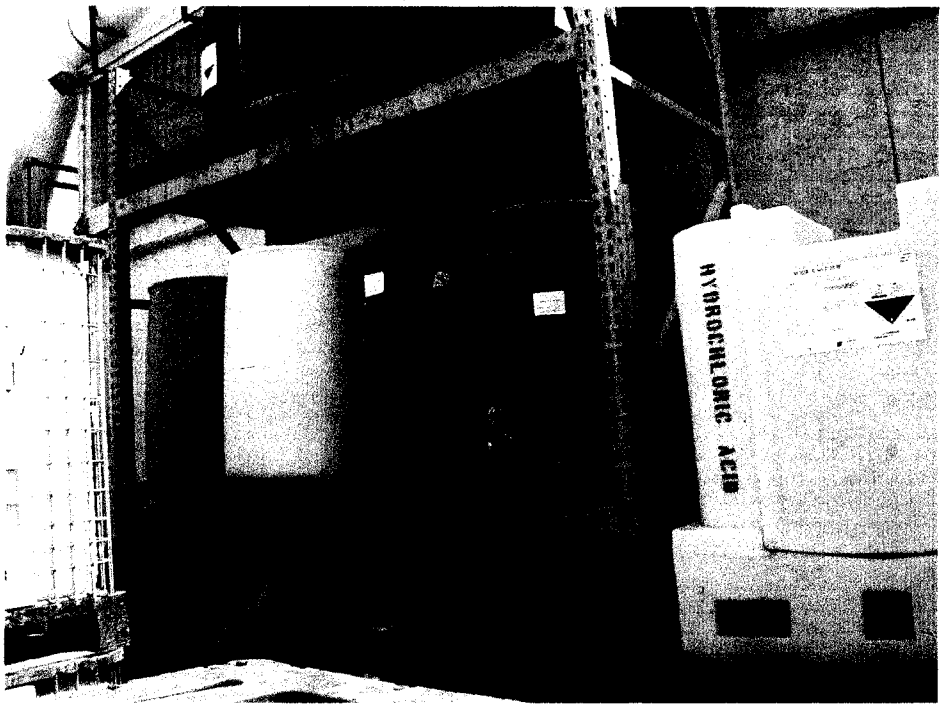


2. Proce
ss line (elect
roless nickel
)

3. Totes in 90
Day Storage
Area Adjacent to
Chemical Storage

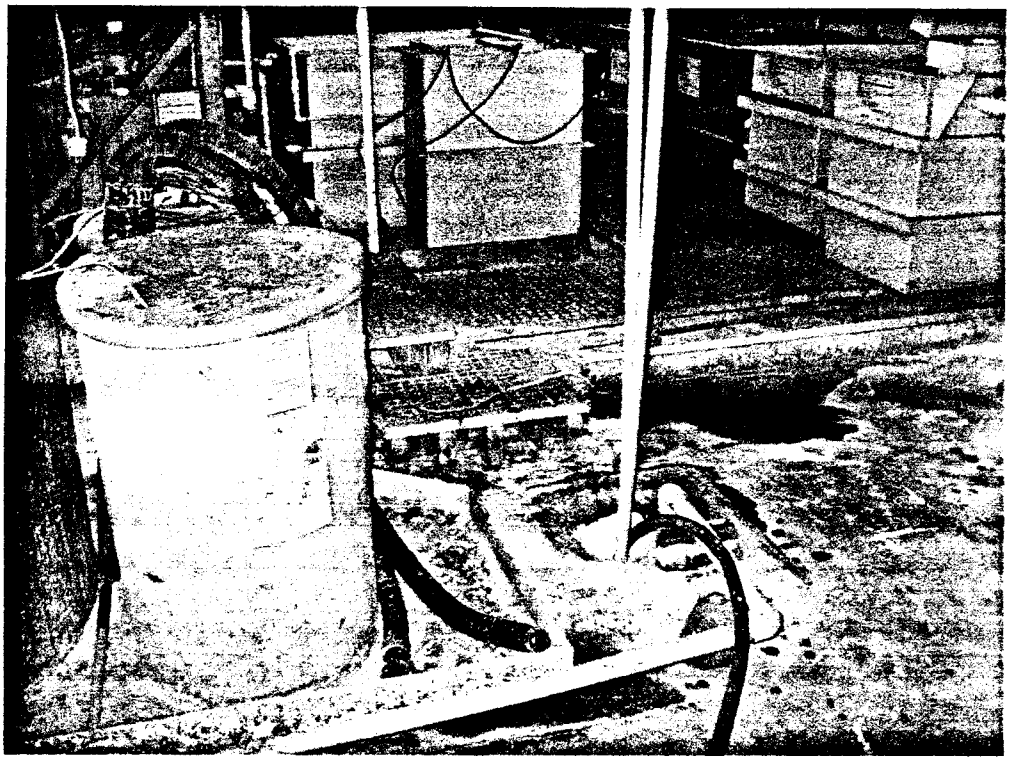


90 Day Adjacent Storage view)

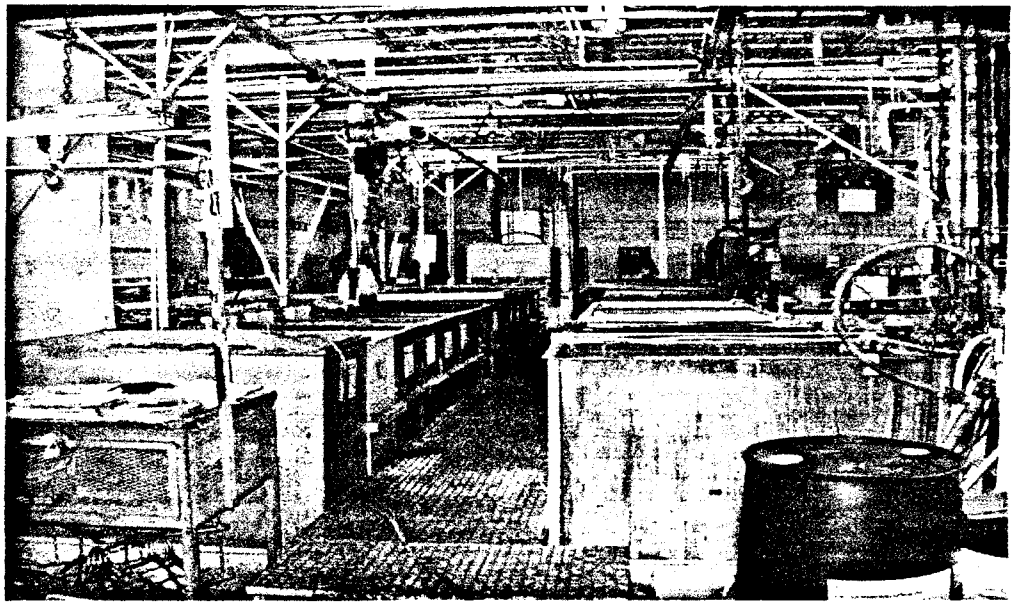


4. Totes in Storage Area to Chemical (another

5. Satellite Accumulation Area in Chemical Storage Area (product and waste storage)

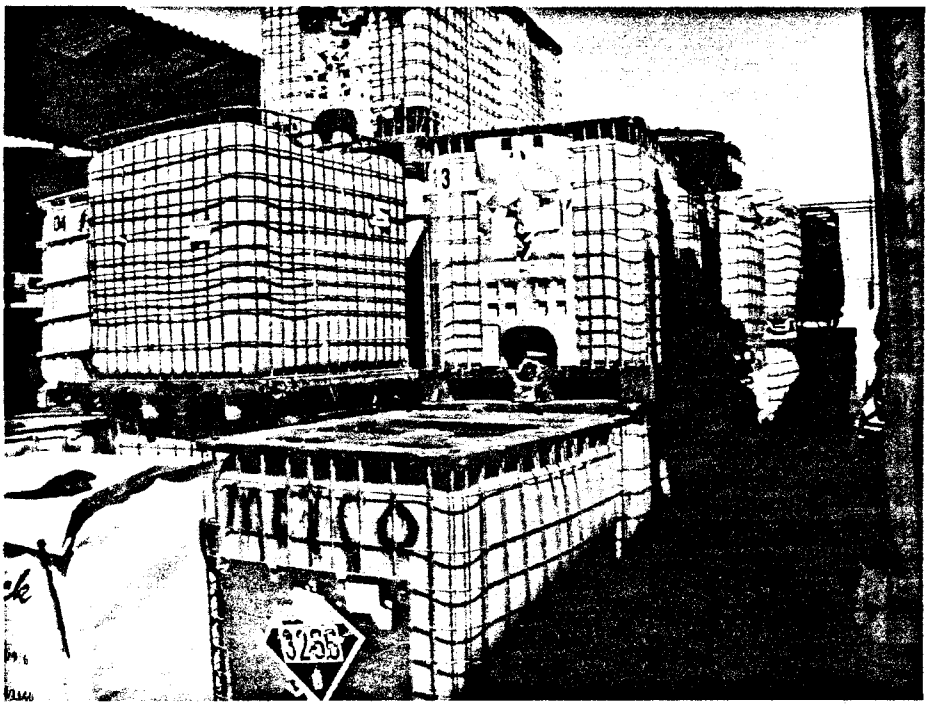


1. Wastewater Treatment System's Discharge Area



2. Electroless Nickel Process Line

3. Totes in 90 Day Storage Area Djacent to Chemical Storage



4. Totes in 90 Day Storage Area Adjacent to Chemical Storage (Another View)

5. Satellite Accumulation Area in Chemical Storage Area
(Combination Waste and Product Storage)

Attachment 2

Please print or type with ELITE type *(12 characters per inch)* in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 9-30-88.
GSA No. 0246-EPA-OT

United States Environmental Protection Agency
Washington, DC 20460

EPA Notification of Hazardous Waste Activity

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

For Official Use Only

Comments: C C

C F		T/A	C 1	Approved	Date Received (yr. mo. day)
	AZD 98-248-6169			EKR	900405

I. Name of Installation

C: MetCo Metal Finishing Inc.

II. Installation Mailing Address

Street or P.O. Box — C 3: 3508 E Corona Street

City or Town	State	ZIP Code
C 4: Phoenix	AZ	85040

III. Location of Installation

Street or Route Number — C 5: 3508 E Corona Street

City or Town	State	ZIP Code
C 6: Phoenix	AZ	85040

IV. Installation Contact

Name and Title *(last, first, and job title)*	Phone Number *(area code and number)*
C 2: Williams Mark Tech Dir	602 926 9040

V. Ownership

A. Name of Installation's Legal Owner	B. Type of Ownership *(enter code)*
C R: Metco Metal Finishing	P

VI. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions.)*

A. Hazardous Waste Activity

- [X] 1a. Generator
- [X] 1b. Less than 1,000 kg/mo.
- [ ] 2. Transporter
- [ ] 3. Treater/Storer/Disposer
- [ ] 4. Underground Injection
- [ ] 5. Market or Burn Hazardous Waste Fuel *(enter 'X' and mark appropriate boxes below)* (2)
  - [ ] a. Generator Marketing to Burner
  - [ ] b. Other Marketer
  - [ ] c. Burner

B. Used Oil Fuel Activities

- [ ] 6. Off-Specification Used Oil Fuel *(enter 'X' and mark appropriate boxes below)* 013 Maricopa
  - [ ] a. Generator Marketing to Burner
  - [ ] b. Other Marketer
  - [ ] c. Burner
- [ ] 7. Specification Used Oil Fuel Marketer *(or On site Burner)* Who First Claims the Oil Meets the Specification

VII. Waste Fuel Burning: Type of Combustion Device *(enter 'X' in all appropriate boxes to indicate type of combustion device(s) in which hazardous waste fuel or off-specification used oil fuel is burned. See instructions for definitions of combustion devices.)*

- [ ] A. Utility Boiler
- [ ] B. Industrial Boiler
- [ ] C. Industrial Furnace

VIII. Mode of Transportation *(transporters only — enter 'X' in the appropriate box(es)*

- [ ] A. Air
- [ ] B. Rail
- [ ] C. Highway
- [ ] D. Water
- [ ] E. Other *(specify)*

IX. First or Subsequent Notification

Mark 'X' in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your installation's EPA ID Number in the space provided below.

- [ ] A. First Notification
- [X] B. Subsequent Notification *(complete item C)*

still active at other address

C. Installation's EPA ID Number: AZD982338006

Continue on reverse

per phone 4-6-90 SD portfolio 1135 N. McQueen Gilbert

4

ID — For Official Use Only														
C													T/A	C
W														1

. Description of Hazardous Wastes *(continued from front)*

. **Hazardous Wastes from Nonspecific Sources.** Enter the four-digit number from 40 *CFR* Part 261.31 for each listed hazardous waste from nonspecific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
F006	F019				
7	**8**	**9**	**10**	**11**	**12**

. **Hazardous Wastes from Specific Sources.** Enter the four-digit number from 40 *CFR* Part 261.32 for each listed hazardous waste from specific sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
19	**20**	**21**	**22**	**23**	**24**
25	**26**	**27**	**28**	**29**	**30**

. **Commercial Chemical Product Hazardous Wastes.** Enter the four-digit number from 40 *CFR* Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31	32	33	34	35	36
37	**38**	**39**	**40**	**41**	**42**
43	**44**	**45**	**46**	**47**	**48**

. **Listed Infectious Wastes.** Enter the four-digit number from 40 *CFR* Part 261.34 for each hazardous waste from hospitals, veterinary hospitals, or medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

. **Characteristics of Nonlisted Hazardous Wastes.** Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. *(See 40* CFR *Parts 261.21 — 261.24)*

☐ 1. Ignitable *(D001)* ☐ 2. Corrosive *(D002)* ☐ 3. Reactive *(D003)* ☐ 4. Toxic *(D00C)*

II. Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Name and Official Title *(type or print)*	Date Signed
M. C. Williams	Mark Williams, Technical Dire	7/2/90

EPA Form 8700-12 (Rev. 11-85) Reverse

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 10-31-91
GSA No. 0245-EPA-OT

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law (Section 3010 of the Resource Conservation and Recovery Act).

EPA Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only)
91.12.06

I. Installation's EPA ID Number *(Mark 'X' in the appropriate box)*

[ ] A. First Notification [X] B. Subsequent Notification *(complete item C)*

C. Installation's EPA ID Number: AZD982486169

II. Name of Installation *(Includes company and specific site name)*

Metco Metal Finishing Inc.

III. Location of Installation *(Physical address not P.O. Box or Route Number)*

Street: 3508 E. Corona St

Street (continued):

City or Town: Phoenix | State: AZ | ZIP Code: 85234-

County Code: 013 | County Name: Maricopa

IV. Installation Mailing Address *(See Instructions)*

Street or P.O. Box: SAME

City or Town: | State: | ZIP Code: -

V. Installation Contact *(Person to be contacted regarding waste activities at site)*

Name *(last)*: Williams | *(first)*: Mark

Job Title: Technical Direc. | Phone Number *(area code and number)*: 602-926-9040

VI. Installation Contact Address *(See Instructions)*

A. Contact Address Location: [X] Mailing: [ ] | B. Street or P.O. Box:

City or Town: | State: | ZIP Code: -

VII. Ownership *(See Instructions)*

A. Name of Installation's Legal Owner: K and B Enterprises

Street, P.O. Box, or Route Number: 3509 E Corona St.

City or Town: Phoenix | State: AZ | ZIP Code: 85234-

Phone Number *(area code and number)*: 602-276-4124 | B. Land Type: P | C. Owner Type: F | D. Change of Owner Indicator: Yes [ ] No [X] | (Date Changed) Month Day Year:

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 10-31-91
GSA No. 0246-EPA-OT

ID - For Official Use Only												

VIII. Type of Regulated Waste Activity (Mark 'X' in the appropriate boxes. Refer to instructions.)

A. Hazardous Waste Activity

1. Generator (See instructions)
   - [X] a. Greater than 1000kg/mo (2,200 lbs.)
   - [ ] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [ ] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes
   - Mode of Transportation
     - [ ] 1. Air
     - [ ] 2. Rail
     - [ ] 3. Highway
     - [ ] 4. Water
     - [ ] 5. Other - specify
3. [ ] Treater, Storer, Disposer at Installation) Note: A permit is required for this activity; see instructions
4. Hazardous Waste Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketers
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
5. [ ] Underground Injection Control

B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketer
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
2. [ ] Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification

IX. Description of Regulated Wastes (Use additional sheets if necessary.)

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. (See 40 CFR Parts 261.21 - 261.24)

1. Ignitable (D001)	2. Corrosive (D002)	3. Reactive (D003)	4. Toxicity Characteristic (D000)	(List specific EPA hazardous waste number(s) for the Toxicity Characteristic contaminant(s))			
[ ]	[X]	[ ]	[X]	D008	D007		

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1	2	3	4	5	6
F006	F019	F001	F003		
7	**8**	**9**	**10**	**11**	**12**

C. Other Wastes. (State or other wastes requiring an I.D. number. See instructions.)

1	2	3	4	5	6

X. Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Signature	Name and Official Title (type or print)	Date Signed
Mark C. Williams	Mark C. Williams Tech Dir	Nov 30, 1991

XI. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)

Attachment 3

U.S. Environmental Protection Agency Region 9
Pollution Prevention Program
Extending Electroless Nickel Bath Life Using Electrodialysis

INTRODUCTION

This pollution prevention (P2) project was conducted under a partnership between U.S. Environmental Protection Agency (EPA) Region 9; the Arizona Department of Environmental Quality; the City of Phoenix; the American Electroplaters and Surface Finishers Association; and Metco Metal Finishing, Inc. (Metco). This partnership was created to promote P2 techniques and technologies, identify P2 technology needs, and accelerate P2 technology transfer within the metal finishing industry. Technical support for this project was provided by Tetra Tech EM Inc. The project was funded by EPA Region 9.

ELECTROLESS NICKEL PLATING

Electroless nickel (EN) plating is a nonelectrolytic process that uses chemical oxidation and reduction reactions to produce a nickel deposit on parts. EN plating is the most common type of nonelectrolytic plating performed and has the following advantages over conventional nickel electroplating: (1) a uniform coating is produced on parts, even those with complex shapes; (2) EN deposits are typically less porous, providing excellent wear and corrosion resistance; (3) nonconducting surfaces can be nickel-plated; and (4) racking may be simpler because no electrical contact is needed between parts and the rack.

Electroless Nickel Plating Chemistry

Ni^{+2}	+	NaH_3PO_2	+	buffers, complexors	=>	(Ni + P)	+	H_2	+	NaH_3PO_3
Nickel ion		Hypophosphite				Nickel deposit		Hydrogen gas		Orthophosphite

EN baths are successfully operated over 15 regenerations using electrodialysis; annual cost savings at one facility are $50,570 from reduced EN chemical use, liquid waste disposal, and rejection of parts.

READ THIS FACTSHEET TO DISCOVER HOW!

The main constituents of an EN bath include nickel ions, hypophosphite, buffers, and complexors. The nickel ions, often added to the bath as nickel sulfate, combine with phosphorous during the plating process to form the nickel deposit. Hypophosphite, typically present as sodium hypophosphite, is the reducing agent that catalyzes chemical reduction of nickel ions. Buffers maintain the pH of the bath, and complexors maintain the nickel ions in soluble form; both stabilize the bath and help maintain a steady plating rate.

BY-PRODUCTS AND CONTAMINANTS

During EN plating, by-products of the chemical reaction, including orthophosphite, sodium sulfate, and ammonia, build up and decrease bath performance. Orthophosphite, which is produced when hypophosphite is oxidized during the plating reaction, is the most significant by-product. As the concentrations of by-products increase, the nickel deposition rate decreases. EN bath use is measured in metal turnovers (MTO); one MTO is defined as plating onto parts the amount of nickel equivalent to that in a single new bath. During production, chemicals are added to the bath and multiple MTOs are produced from a single bath. As the EN solution ages, the deposition rate of the bath plating decreases (see Figure 1). In addition, the nickel plating becomes more porous and tensile-stressed, and its appearance becomes less lustrous. Physical properties such as magnetics and solderability may also be adversely affected.

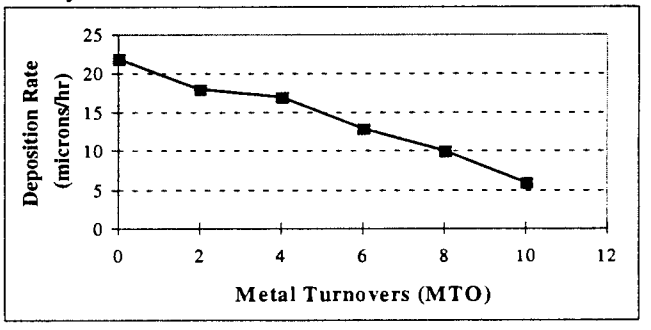


Figure 1. The EN deposition rate decreases by 40 percent after six MTOs. In most commercial applications, EN baths average five MTOs for aluminum parts and seven MTOs for ferrous parts before they are spent.

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Metals from parts being plated, such as aluminum, zinc, and copper, and dragin contaminants may also accumulate in the bath and negatively affect bath quality and stability. Eventually the nickel deposit no longer meets specifications or the deposition rate reaches a level that does not meet production requirements, resulting in the need to dump the spent bath.

Frequent bath make-ups result in significant operating costs from high EN process chemical purchases. In addition, the large volume of highly concentrated spent EN solution generated requires expensive treatment and disposal. Spent EN baths must be treated separately from other waste streams because the complexors can interfere with traditional metal precipitation processes. On-site treatment of spent EN solution typically involves nickel plate-out using caustic and other chemicals and bleeding the treated solution into a wastewater treatment system. Some facilities ship their spent EN baths off site to a treatment facility that reclaims and recycles the nickel.

ELECTRODIALYSIS

Electrodialysis can be used to regenerate spent EN baths by selectively removing orthophosphite and other contaminants. An electrodialysis unit consists of a stack of semipermeable, cation- and anion-selective membranes arranged in alternating order with a cathode and anode at either end of the stack (see Figure 2). During electrodialysis operations, spent EN solution is pumped into the "concentrate" compartments of the unit, and deionized (DI) water is pumped into the "diluate" compartments. A rectifier creates an electrical potential across the membranes, causing anions to migrate toward the anode and cations to migrate toward the cathode. Anion-selective membranes allow only undesirable anions such as orthophosphite and sulfate to flow into the diluate compartment of the unit while retaining the hypophosphite in the concentrate compartments. Cation-selective membranes allow sodium and other cationic contaminants ions to pass through the membrane into the diluate compartments while retaining the larger nickel ions in the concentrate compartments. In this way, desirable EN bath components are retained in the concentrate, which is reused in the EN process bath, and undesirable components accumulate in the diluate, which is removed for disposal.

Electrodialysis is a batch process, and the regeneration rate depends on the size of the electrodialysis unit and the volume and concentration of influent spent solutions. The electrodialysis unit has a meter that monitors the total dissolved solids (TDS) or conductivity of the EN solution. As the concentrations of orthophosphite and other by-products decrease in the EN bath, TDS levels and conductivity decrease proportionately. Orthophosphite concentrations can also be directly measured using titration methods.

Electrodialysis Membranes

- Membrane size depends on the bath volume, dump frequency, and bath concentration.
- The total membrane surface area typically ranges from 35 to 190 square feet.
- The maximum temperature rating of a membrane is typically about 110 °F; therefore, baths must be cooled before electrodialysis.
- The membrane life expectancy ranges from 1 to 7 years.
- Fouling can be minimized by filtering the solution before electrodialysis.

The electrodialysis process typically produces a regenerated bath with 60 percent of the original bath volume. Most of the volume lost in the electrodialysis process is dissolved salts and water, but small amounts of desirable components, such as nickel, hypophosphite, buffers, and complexors, are also lost to the diluate stream. After bath regeneration, replenishment chemicals are added to the bath in order to restore the chemical concentration and balance, and DI water is added to restore the original bath volume. The diluate waste stream is generated at a rate of about 40 to 60 gallons per 100 gallons of EN bath regenerated, part of which is DI water. The diluate contains a low concentration of nickel and small amounts of active chelators, and it can usually be bled into a conventional wastewater treatment system, or disposed of off site

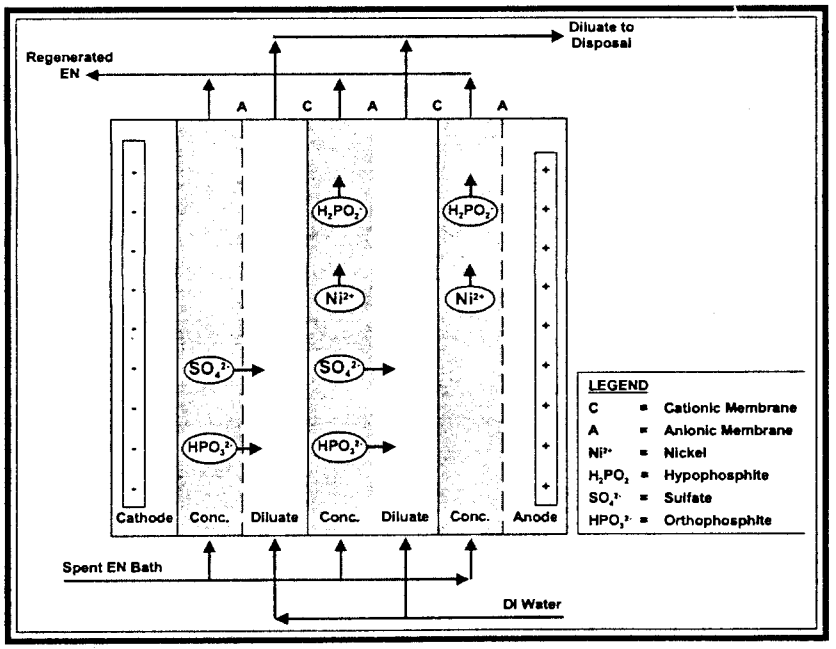


Figure 2. Cross section of electrodialysis unit

CASE STUDY: METCO METAL FINISHING, INC.

Metco is a medium-sized metal finishing job shop in Phoenix, Arizona. Metco has five primary process lines: (1) copper, tin, and EN plating; (2) zinc plating; (3) anodizing and conversion coating; (4) zinc phosphate; and (5) bright nickel.

On the copper, tin, and EN plating line,

Typical Maintenance Requirements for Electrodialysis Unit

- ✓ ***Pretreatment filters*** - The frequency of changing pretreatment filters varies depending on the amount of suspended solids, oil, and grease in the bath.
- ✓ ***Membrane cleaning and replacement*** - The membranes require periodic cleaning to prevent fouling and may need to be replaced every 1 to 7 years.
- ✓ ***Cathode stripping*** - During electrodialysis, a small amount of nickel may be plated onto the cathode. The cathode is made of stainless steel and can be stripped in dilute nitric acid.

Metco has three 170-gallon EN plating tanks; while two tanks are being used for plating, the third is used for bath storage or is cleaned. Metco uses Fidelity 9002 bath chemicals supplied by OMG Fidelity, Inc., that provide a bright, 7- to 9-percent phosphorous (mid-phosphorous) nickel deposit.

Before using electrodialysis, Metco made up 71 new EN baths per year; used 9,120 gallons of EN plating solution per year; and spent $37,630 for new bath make-up chemicals and $43,380 for chemical additions. The average EN bath at Metco was operated for five to six MTOs before disposal. Metco shipped spent baths off site for treatment and disposal at a cost of $31,740 per year.

ELECTRODIALYSIS TRIAL

In cooperation with EPA Region 9, Metco identified electrodialysis as a technology with the potential to reduce its waste by recovering nickel and hypophosphite from spent EN baths for reuse. To determine the effectiveness of this technology, Metco performed a 3-month trial with a demonstration electrodialysis unit manufactured by Zero-Discharge Technologies, Inc., for OMG Fidelity, Inc. The demonstration unit had the capacity to reduce the contaminant level of a 100-gallon bath used for five MTOs to a level corresponding to one MTO in 48 hours. During the trial period, Metco regenerated and reused an EN bath six times with no degradation in bath or plating quality. The EN bath was used for four or five MTOs between regenerations, or for a total of over 28 MTOs. Each regeneration of a spent EN bath reduced its orthophosphite concentration from an average of 140 to 28 grams per liter.

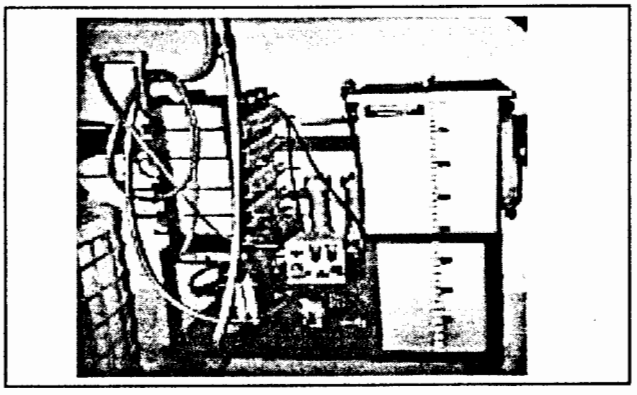


Figure 3. Full-scale electrodialysis unit at Metco

FULL-SCALE ELECTRODIALYSIS IMPLEMENTATION

Based on the performance of the demonstration unit, Metco decided to implement a full-scale electrodialysis unit manufactured by Zero-Discharge Technologies, Inc. (see Figure 3). The unit has a total of 30 diluate and concentrate compartments and was designed with a regeneration capability of reducing the contaminant level of a 100-gallon bath from a six-MTO equivalent to a one-MTO equivalent in 48 hours. The unit requires 21 ampere of electrical current and 380 watts per hour of electrical power.

After a 3-month shakedown period, Metco is using the electrodialysis unit to operate EN baths through 15 regenerations and five MTOs between regenerations, for a total of over 75 MTOs per bath. Metco maintains four EN baths — two in operation, one in storage, and one undergoing electrodialysis — to ensure the availability of regenerated EN baths for production.

Reject rates on the EN line have decreased by about 50 percent, and reject costs have decreased from an average of $1,700 to $523 per month. Metco attributes most of this change to the more consistent plating quality provided by dialyzed EN baths.

Because of the increased EN bath life, Metco estimates that it will have to prepare only three new baths per year compared to 71 baths per year without electrodialysis. Moreover, because of EN bath regeneration, EN process chemical purchases have decreased by 25 percent.

The electrodialysis unit has also improved process efficiency at Metco by significantly decreasing the "break-in" time for EN baths. Line operators prefer using EN baths processed by electrodialysis because they provide the desired plating quality almost immediately, whereas new EN baths achieve the desired quality only after one MTO.

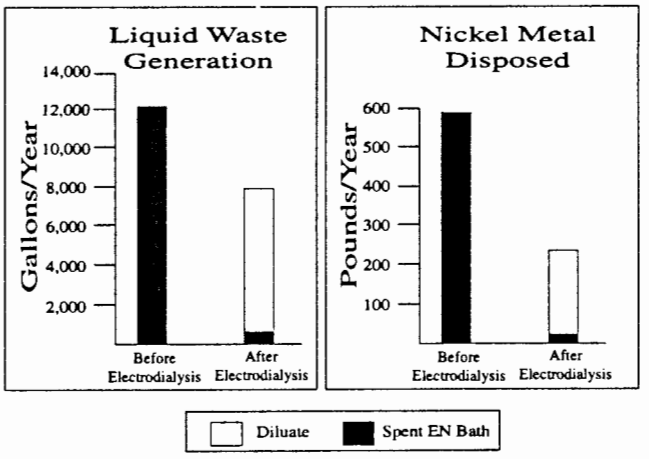


Figure 4. Total EN liquid waste disposal has been reduced by 33 percent.

Figure 5. Total nickel mass disposed has been reduced by 56 percent.

EN bath regeneration generates about 100 gallons of diluate waste solution per 170 gallons of spent EN bath regenerated. Despite the new diluate waste, Metco has reduced the total volume of its EN liquid waste streams by 3,860 gallons per year using electrodialysis (see Figure 4). Based on the nickel concentrations in the spent EN bath and diluate waste streams, the total mass of nickel disposed of has decreased by 321 pounds per year (see Figure 5). Total EN process chemical use has decreased by 25 percent, and EN liquid waste generation has decreased by 33 percent.

Metco ships the diluate waste stream off site for treatment at a unit cost of $0.77 per gallon compared to the $2.63 per gallon paid for disposal of spent EN solution. Therefore, Metco has realized a 77 percent reduction in the total liquid waste disposal cost associated with EN. Other facilities may realize even greater savings by treating the diluate on site in a conventional wastewater treatment system. For example, the typical operating cost for a conventional wastewater treatment system is $0.15 per gallon of wastewater. Metco is currently evaluating and testing on-site treatment options for the diluate to further reduce the disposal cost; however, Metco's current ion exchange wastewater treatment system may have difficulty in handling the high TDS content of the diluate.

Total EN process chemical use has decreased by 25 percent, and EN liquid waste generation has decreased by 33 percent.

The capital cost of the 30-compartment electrodialysis unit is $28,000. A total of 4.5 hours of Metco staff labor was required to install the unit. **The payback period for the unit is about 7 months.**

Operation and Maintenance

- Each EN bath regeneration takes 60 hours and 2.5 hours of staff labor.
- The full-scale unit uses 1-micron pretreatment filters that are changed every 3 months.
- Membranes are cleaned every 3 months using nitric acid, requiring 2 hours of staff labor.
- Three months of shakedown time was required for the full-scale unit.
- Solid, plastic fittings and plumbing should be used to avoid small leaks associated with flexible fittings and hoses.
- Electrodialysis effectiveness is monitored by performing nickel, hypophosphite, and orthophosphite analyses using on-site titration methods.

ELECTRODIALYSIS CASE STUDY RESULTS

BEFORE - WITHOUT ELECTRODIALYSIS

EN Bath O&M	Unit Cost	Annual Cost[a]
New EN Bath Make-ups	$530/bath	$37,630
EN Chemical Additions	$611/bath	$43,380
Spent EN Solution Disposal	$447/bath	$31,740
Labor - Make-ups	$25/bath	$1,780
EN Rejects - Cost	$1,700/month	$20,400
		Total = $134,930

AFTER - WITH ELECTRODIALYSIS

EN Bath O&M	Unit Cost	Annual Cost
New EN Bath Make-ups	$530/bath	$1,590[b]
EN Chemical Additions	$542/bath	$43,380[d]
Regeneration Additions	$202/regen	$15,550[c]
Spent EN Solution Disposal	$447/bath	$1,340[b]
Labor - Make-ups	$25/bath	$75[b]
EN Rejects - Cost	$523/month	$6,280
		Total = $68,220

Electrodialysis Unit O&M	Unit Cost	AnnualCost[c]
Diluate Disposal	$77/regen	$5,930
Labor - Regeneration	$125/regen	$9,630
Labor - Membrane Cleaning	$100/cleaning	$400
Electricity	$13/month	$160
		Total = $16,120

Total Savings = $50,600/year
Electrodialysis Unit Capital Cost = $28,000
Installation Labor = $225
Total Capital Cost = $28,225

Payback Period = 7 months

[a] = Based on 71 new bath make-ups per year
[b] = Based on three new bath make-ups per year
[c] = Based on 77 regenerations per year
[d] = Chemical additions during bath operation remained the same.

For more information on the Metco case study or other EPA Region 9 P2 projects, please contact the following individuals:

Leif Magnuson (EPA Region 9)
(415) 744-2153

Mark Williams (Metco)
(602) 276-4120

Doug Vogel (OMG Fidelity, Inc.)
(602) 998-3723

Assistance for this fact sheet was provided by Tetra Tech EM Inc.

Attachment 4

Hazardous Waste Inspection Worksheet

Date of Inspection:

Satel.	Cont. No.	Waste No.	Waste Description	Qty	Days Accum.	Inspection: X=okay , O=needs attention Top	Label	Integrity	Inspector Signature
					7305				
x	DOT	2240	Paint Solids	30 GALLS	222				
x	DOT	2357	Fluorescent Bulbs	5 LB.	175				
x	DOT	2500	Paint Liquid	20 GALLS	61				
x	POLY D	2502	Caustic Soln	15 GALLS	61				
	DOT	2528	Sludge	40 GALLS	42				
	CU	2536	Filters	1 cu yrd	39				
	US08	2563	Nickel Acetate	275 GALLS	21				
	H21	2568	Chromate	330 GALLS	18				
	H01	2571	Nitric	275 GALLS	18				
	H09	2572	Caustic Soln	275 GALLS	18				
	H08	2573	Caustic Soln	275 GALLS	18				
	T19	2574	HCL	360 GALLS	15				
	H07	2575	HCL	275 GALLS	15				
	H03	2576	HCL	275 GALLS	15				
	H02	2578	Chromate	275 GALLS	15				
	H22	2579	Nitric	165 GALLS	15				
	US01	2580	Chromate	275 GALLS	14				
	US02	2581	Caustic Soln	275 GALLS	14				
	US07	2582	Caustic Soln	275 GALLS	13				
	US06	2583	Electroless Nickel	275 GALLS	13				
	H05	2584	Clear Chromate	275 GALLS	11				
	US03	2585	Caustic Soln	275 GALLS	6				
	US04	2586	Caustic Soln	275 GALLS	6				
	US05	2587	Caustic Soln	50 GALLS	6				

Date Printed: Tuesday, March 20, 2001

Hazardous Waste Inspection Worksheet

Date of Inspection:

Satel.	Cont. No.	Waste No.	Waste Description	Qty	Days Accum.	Inspection: X=okay , O=needs attention Top	Label	Integrity	Inspector Signature
	H22	2588	HCL	150 GALLS	6				
	H13	2589	HCL	275 GALLS	1				
	H08	2590	Orthophosphite	275 GALLS	1				

Attachment 5

METCO METAL FINISHING

YEARLY TRAINING UPDATE

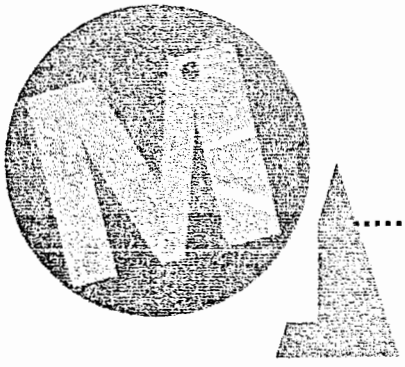
HAZARD COMMUNICATION

PPE

EMERGENCY RESPONSE

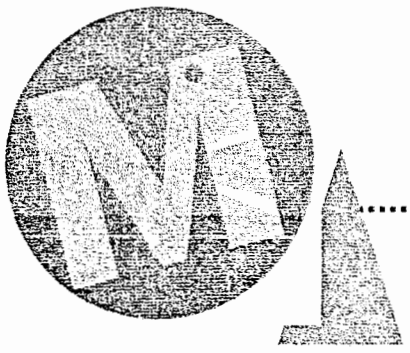
TRAINING UPDATES

- HAZARD COMMUNICATION AND RIGHT TO KNOW
- EMERGENCY RESPONSE
- PERSONAL PROTECTIVE EQUIPMENT



HAZARD COMMUNICATION

- EMPLOYER RESPONSIBLE FOR TRAINING
- EMPLOYEE TRAINING
  - MSDS (Material Safety Data Sheet)
  - Labels
  - Training



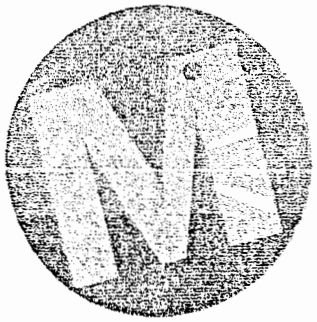
HAZARD COMMUNICATION

MSDS

(Material Safety Data Sheet)

- **MSDS LOCATION(s)**
  - LAB
  - MARK WILLIAMS'S OFFICE

- **MSDS REVIEW**
  - NAME OF CHEMICAL
  - INGREDIANTS
  - FIRST AID
  - FIRE
  - SPILL



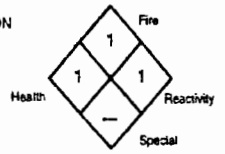
MATERIAL SAFETY DATA SHEET

GREAT WESTERN CHEMICAL COMPANY

ISSUE DATE: 12/22/98	SUPERSEDES: 04/30/97
GREAT WESTERN MSDS NUMBER: 57969	

NFPA 704 DESIGNATION
HAZARD RATING

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Insignificant



1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: G.W. METAL GRABBER

GENERAL USE: Product is used as a heavy metal precipitant to remove metals from wastewater streams.

PRODUCT DESCRIPTION: An aqueous solution of sodium dimethyl dithiocarbamate.

INFORMATION PROVIDED BY:

GREAT WESTERN CHEMICAL COMPANY
Corporate Office
808 S.W. 15th Avenue
Portland, OR 97205
PHONE: 503-228-2600 FAX: 503-221-5767

EMERGENCY PHONE NUMBERS

GREAT WESTERN:	800-497-7455
CHEMTREC:	800-424-9300
CANUTEC:	613-996-6666

2. COMPOSITION & INFORMATION ON INGREDIENTS

COMPONENT	CAS #	OSHA HAZARD	Wt%	ACGIH TLV (TWA)	ACGIH STEL	OSHA PEL (TWA)	OSHA STEL
Sodium N,N-Dimethyldithiocarbamate	000128-04-1	Strong Irritant	40 ± 5	N/A	N/A	N/A	N/A

NDA = No Data Available N/A = Not Applicable

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
A clear, yellow-green to amber liquid with a slight sulfide odor. Liquid may be severely irritating to eyes and skin. Mists may be irritating to eyes, nose, throat and lungs.

POTENTIAL HEALTH EFFECTS:

INHALATION: Exposure to vapors or mists may be moderately irritating to the respiratory tract. Symptoms of exposure may include: a stinging sensation, choking, and coughing.

EYE CONTACT: Exposure to vapors, mists, or liquid may cause severe eye irritation. Symptoms of exposure may include: tearing, redness, swelling, blurred vision, and pain.

SKIN CONTACT: Exposure to vapors, mists, or liquid may cause severe skin irritation. Symptoms of exposure may include: redness, swelling, itching, and pain. No effects from skin absorption have been reported.

INGESTION: Ingestion may cause moderate irritation to the gastrointestinal tract. Symptoms of exposure may include: nausea, vomiting, diarrhea and abdominal pain.

CHRONIC: Prolonged or repeated exposure may cause dermatitis; otherwise the chronic health hazard for exposure is expected to be the same as for acute exposure.

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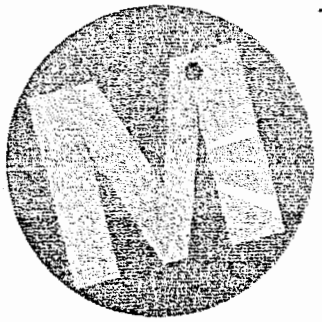


HAZARD COMMUNICATION

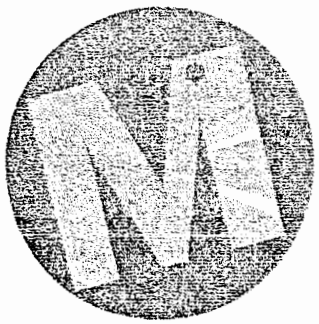
LABELS

- Labels
  - *Required on all containers*
    - Drums
    - Carboys
    - Tanks
    - Pails
    - Lab Containers

HAZARD COMMUNICATION

LABELS

- Labels
  - HMIS Labels (Hazardous Material Identification System)
    - Health - Blue
    - Flammable - Red
    - Reactivity - Yellow
    - PPE - White

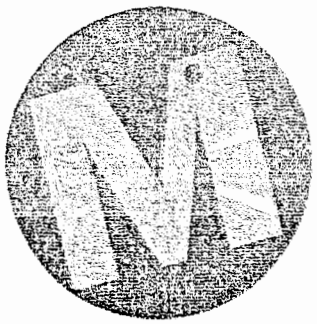


HAZARD COMMUNICATION *LABELS*

- Labels
  - HMIS Labels

(Hazardous Material Identification System)

- #4 - EXTREME (MUY GRAVE)
- #3 - SERIOUS (SERIO)
- #2 - MODERATE (MODERADO)
- #1 - SLIGHT (LIGERO)
- #0 - MINIMAL (MINIMO)
- A-X - PPE DESIGNATION



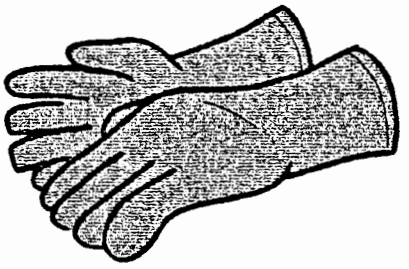
HAZARD COMMUNICATION

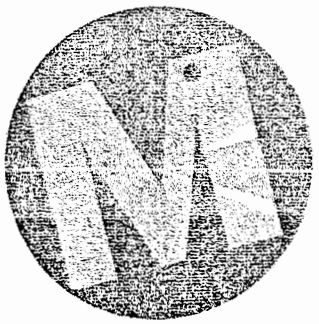
PPE

Personnel Protective Equipment

- Protect you from hazardous chemicals

  - Importance of wearing eye glasses
    - Procedure for contamination to eyes
  - Proper gloves
  - Proper boots
  - -- Proper aprons





EMERGENCY RESPONSE

Health

- **Eye Contamination Procedure**
  - Rinse for 15 minutes minimum
  - Go to Clinic/Hospital: Doctor Visit
    - Bring MSDS Books and find appropriate MSDS
  - Fill injury form
- **Skin Contamination Procedure**
  - Rinse for 15 minutes depending on exposure
  - See above if needed

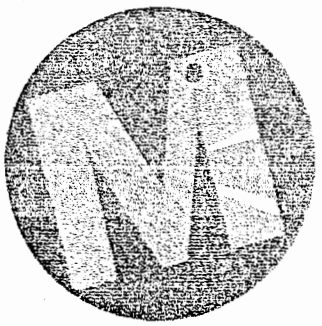
EMERGENCY RESPONSE

Fire

- Location of Fire Equipment (See handout)
- Yearly Fire Equipment Training
- Initial Response to Fire
- Contact Foreman

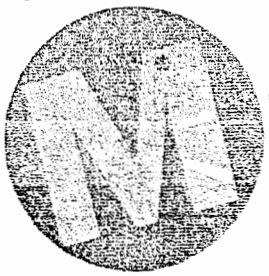
and/or

- Contact Mark Williams and Jim Brown
- Evacuate facility if necessary



EMERGENCY RESPONSE
CHEMICAL RELEASE

- Spill
  - Notify Foreman or Environmental Techs (Jesse or Milan)
  - Contained spill with floor dry or
  - Vacuum and dispose as necessary.
- Release to Air
  - Notify Foreman or Environmental Techs (Jesse or Milan)
  - Evacuate shop or are if needed.
  - Stop reaction



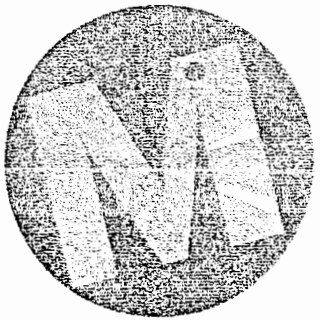
EMERGENCY RESPONSE

Evacuation

- Evacuation Location

(See plant diagram)

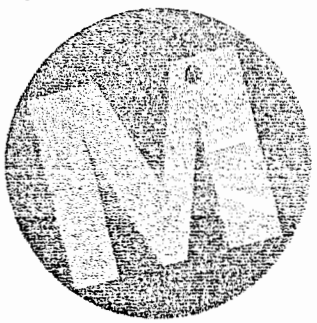
- Announcement
  - P.A.(Speaker)
  - Voice

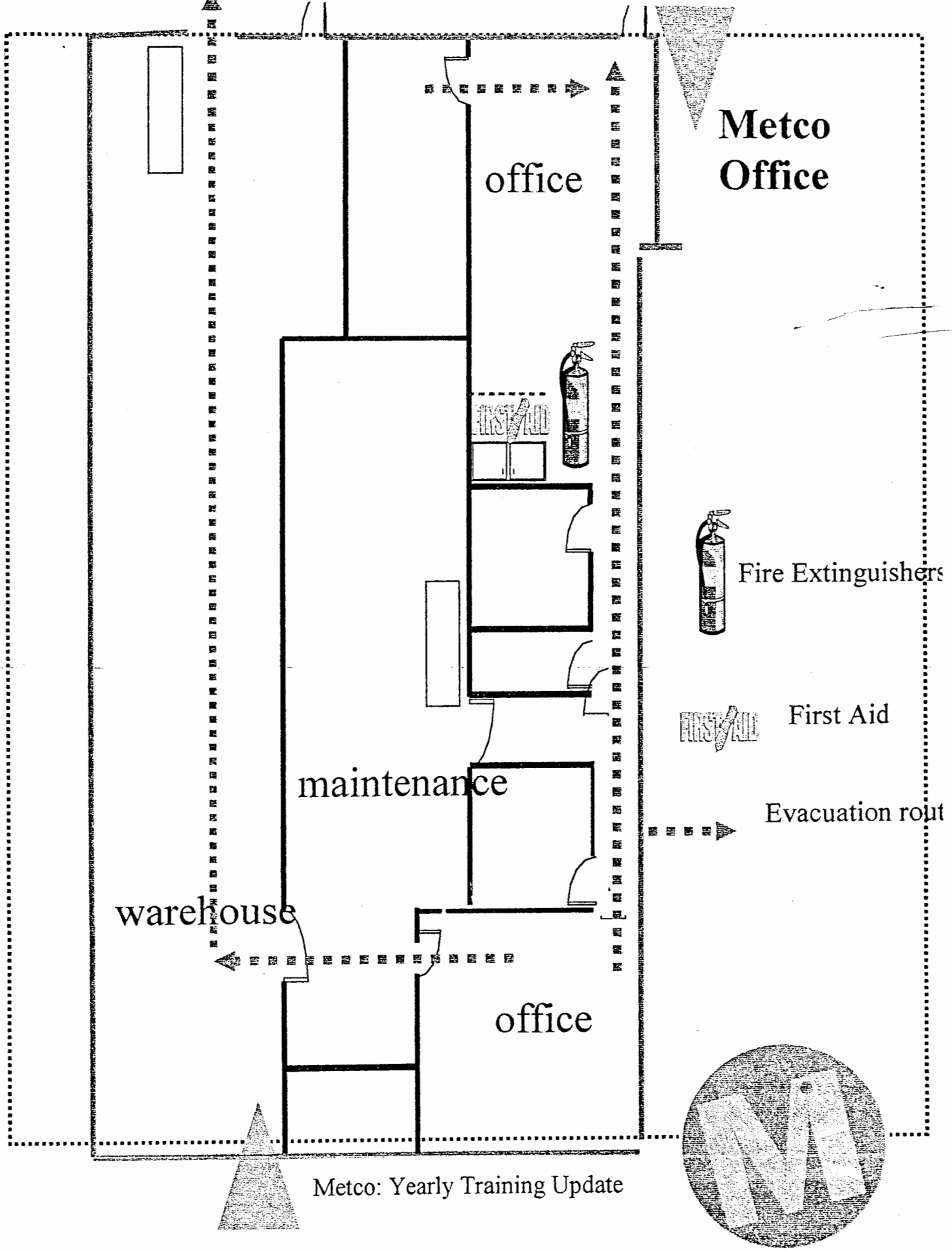


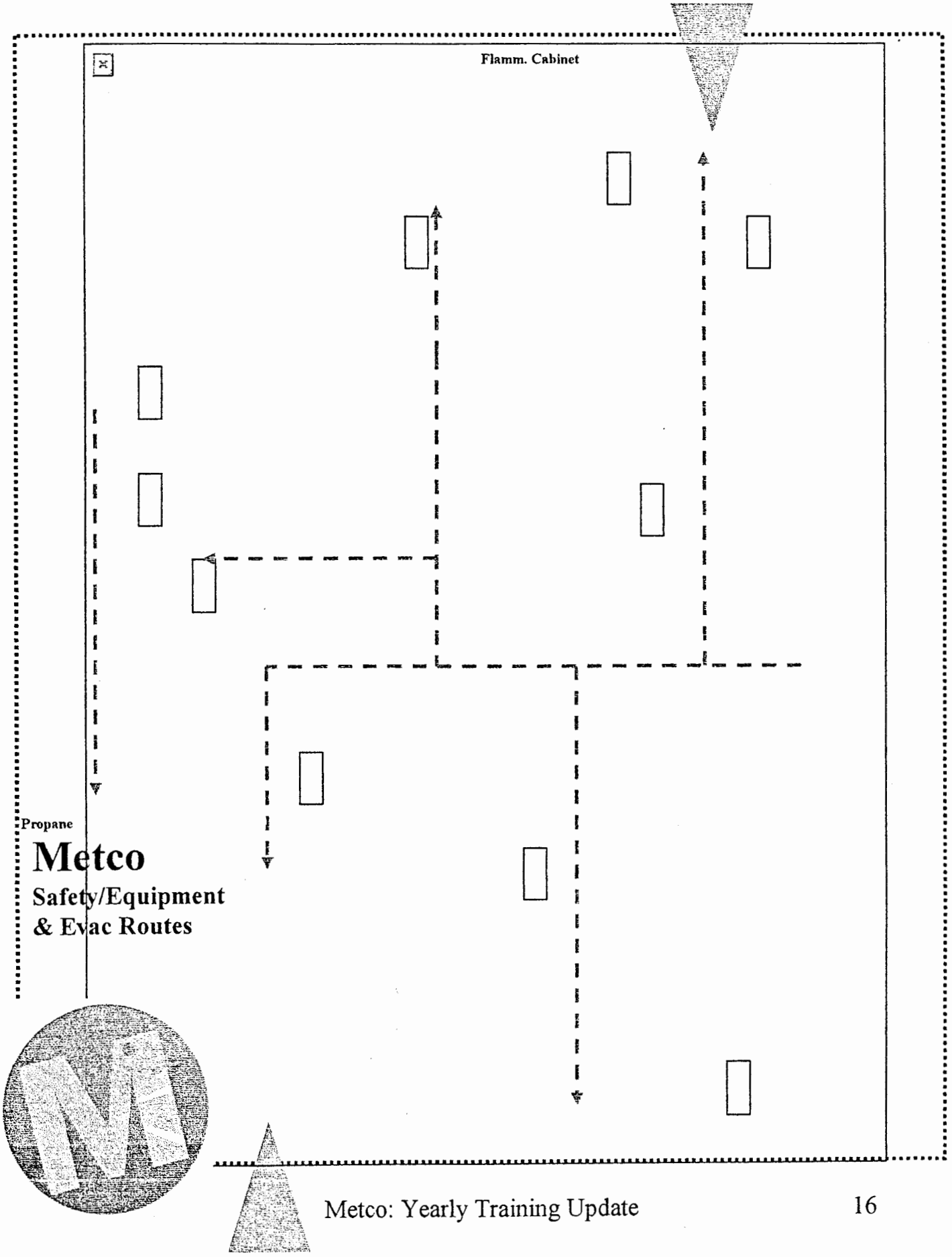
EMERGENCY RESPONSE

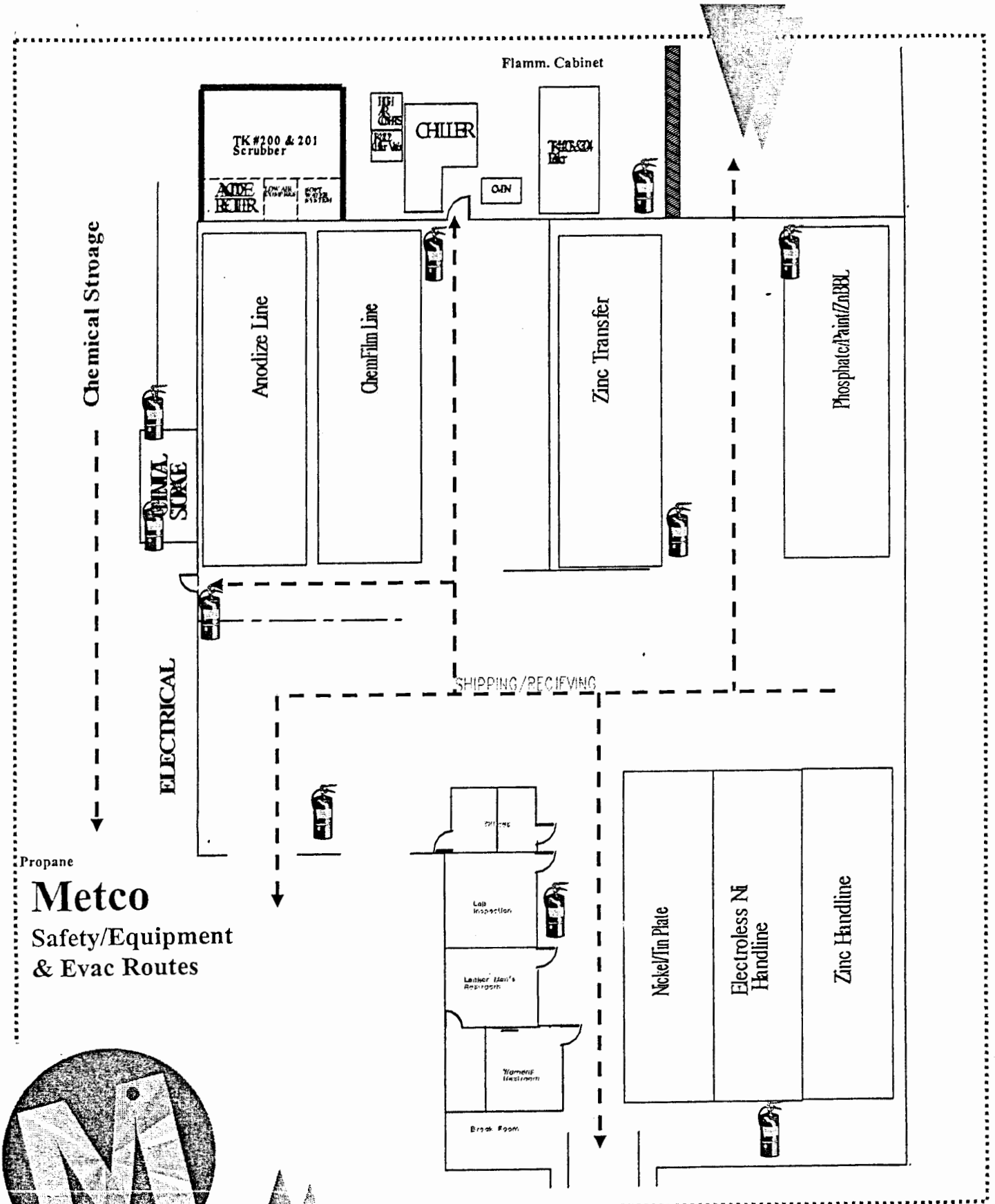
Evacuation

- Evacuation Procedure
  - Evacuate in safe/slow manner
  - Go to designate areas
  - Inform Supervisor/Foreman that you've arrived.
  - Do not leave area without permission from supervisor




Metco
Office
office
maintenance
warehouse
office
Fire Extinguishers
First Aid
Evacuation rout


Flamm. Cabinet
Propane
Metco
Safety/Equipment
& Evac Routes

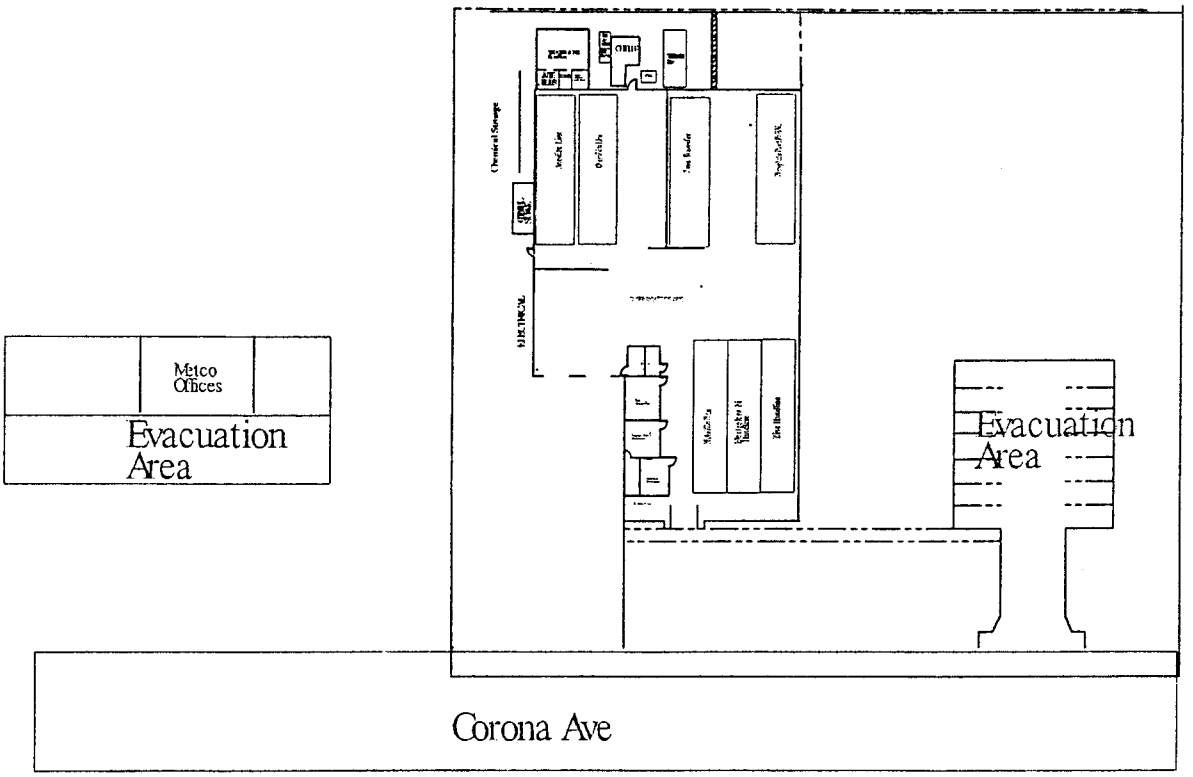


Metco

Safety/Equipment & Evac Routes

Metco

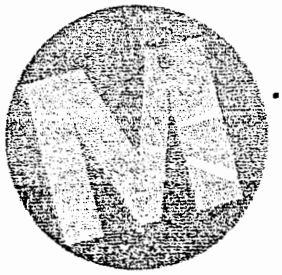
Office and Process Building Evacuation Area(s)



EMERGENCY PHONE NUMBERS

- **Metco Metal Finishing**
  3508 E. Corona Ave Phoenix 85040
  602-276-4120

- **Mark Williams**
  - Home: 480-821-2739
  - Mobile: 602-722-7926
- **Mike Wilson**
  - Home: 602-482-6785
  - Mobile: 602-722-4130
- **Tony Dierks**
  - Home: 602-306-1886
  - Mobile: 602-722-6911



Attachment 6

METCO METAL FINISHING, INC.

April 5, 2001

Carol Hibbard
ADEQ
3033 N. Central Ave.
Phoenix, AZ 85012-2809

RE: Corrective action – ADEQ/EPA Hazardous Waste Audit

Carol,

I would like to address the discrepancies identified during the EPA/ADEQ audit dated on March 20, 01.

90-day storage area:

Eye wash station

Corrective Action: Metco has an extra shower/eye wash station available for use. We will install it, but not until the totes are no longer in use. We will re-evaluate the storage in the chemical/hazardous waste area and then decide on the best location of shower/eyewash station. This will occur no later than July 1, 01.

Communication

Corrective Action: We purchased an alarm button and horn. The button will be located near the Hazardous Waste area and the horn will be located in the shop. After the horn is installed we will train our employees to respond to the horn sound for emergencies in the Hazardous Waste Area. Enclosed is the confirmation from Grainger (supplier). The horn and button will be installed by May 15, 2001.

Aisle Space

Corrective Action: Metco currently uses chemical totes to store and ship our bulk hazardous waste. The current area does not have adequate room for the amount of waste. Metco is in the process of installing a new waste treatment system. This system will significantly reduce the use of the totes. We are on schedule of having the new system fully operational by May 31, 2001. At that time, Metco will have adequate aisle space for storage of all hazardous waste containers.

Plans, Records, Reports, Other

Update contact address in contingency plan.

Corrective Action: Enclosed is an updated contact list for our contingency plan.

3508 E. CORONA AVE. PHOENIX, AZ 85040. (602) 276-4120 FAX (602) 276-0109

METCO METAL FINISHING, INC.

Training – Match people with position description
Corrective Action: Enclosed is the updated Hazardous Waste Job Description Schematic. This list corresponds to the latest training records and will be attached to the training record and updated in the Hazardous Waste Management plan.

I hope this will satisfy your requirements for corrective action from the Exit Debriefing.

If you have any questions, please contact me at the below phone number or address.

Thank you,

Mark Williams
Technical Director

Cc: Kaoru Morimoto, EPA

3508 E. CORONA AVE. PHOENIX, AZ 85040. (602) 276-4120 FAX (602) 276-0109

METCO METAL FINISHING, INC.

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Mark Williams
Technical Director

Cc: Kaoru Morimoto, EPA

3508 E. CORONA AVE. PHOENIX, AZ 85040. (602) 276-4120 FAX (602) 276-0109

IV.
EMERGENCY CONTACTS AND PHONE NUMBERS

Facility Emergency Coordinators

Primary

Mark C. Williams (Technical and Program Director)
1845 E. Kent Ave.
Chandler, Arizona 85225
Telephone: (480) 821-2739
(602) 722-7926 - Car Phone

Alternate 1

James C. Brown Jr. (Vice President of Operations)
1585 E. Kent Ave.
Chandler, Arizona 85225
Telephone: (480) 963-5311
(602) 722-7923 - Car Phone

Alternate 2

Mike Wilson (Maintence Manager
13409 N. 36th St.
Phoenix, Arizona 85032
Telephone: (602) 482-6785
(602) 717-2246 - Car Phone

Emergency Response Telephone Numbers

General Emergency: Police, Fire, Ambulance, Emergency First Response.....911
Arisona Department of Public Safety (DPS).....233-2000
Arizona Department of Environmental Quality Emergency Response Unit..... 207-2330
National Response Center 1-800-424-8802
Chemtrec.....1-800-424-9300
Maricopa County Emergency Response Commission 273-1411
Arizona Emergency Response Commission 257-2330
Maricopa County Bureau of Air Pollution Control (If Applicable)..... 506-6727
City of Phoenix Water and Waste Water (If Applicable)..... Day: 262-7485,262-1859
Other times: 261-8000

Outside Contractor
(Emergency Response Clean-up)

Environmental Response, Inc. (Brad Butler).....967-2802

Emergency Response Personnel

Foreman - Days
Dan Durkiewicz
Telephone: (602) 920-7927

Foreman - 2nd Shift
Amado Basa
Telephone: (602) 743-4173

Hazardous Material Specialist
Milan Kudric
(Environmental Technician)
Telephone: (480) 985-6261

Hazardous Material Specialist
Jessie Chavez
(Environmental Technician)
Telephone: (602) 230-7524

Foreman - 3rd Shift
Dan Livingston
Telephone: (602) 956-8800

See Appendix Figure VII for Hazardous Waste Management Organization Chart and Figure VIII for Chain of Command during an emergency.

Arrangements with Local Authorities

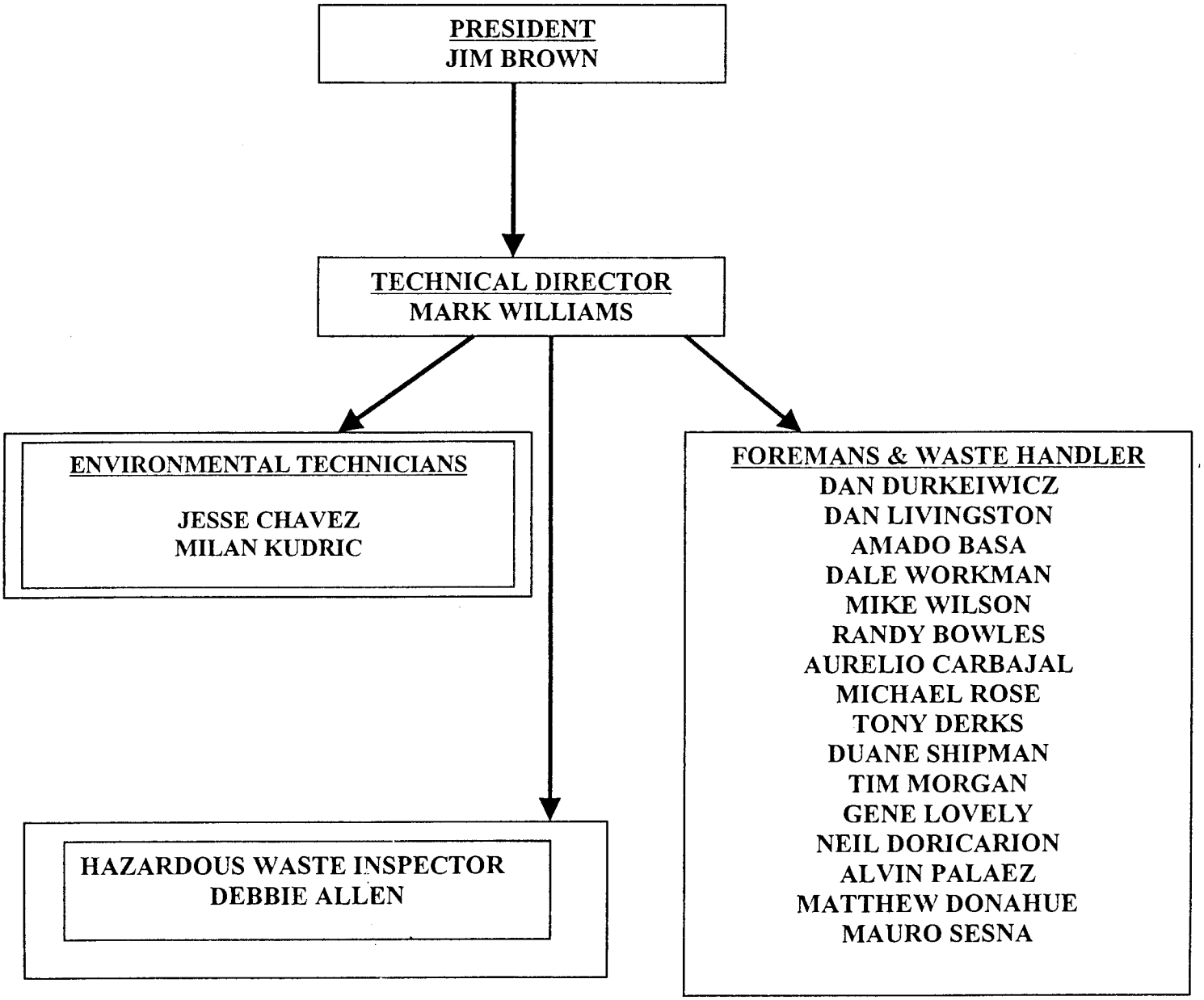
Phoenix Memorial Hospital
Contact: Lois Nyman
Address: 1201 S. Seventh Avenue
Phoenix, Az 85036
Phone: (602) 238-3223
Phone: (602) 420-5820 fax

A copy of the Emergency Response Plan will be sent to Lois Nyman at the above address. The hospital will respond to *Metco's* medical emergency if required. A copy of the MSDS(s) will accompany the employees if they are contaminated by a hazardous substance(s).

Local Police Precinct
(South Precinct)
Contact: Admen Sergeant
Address: 400 W. Southern
Phoenix, Arizona 85040
Phone: (602) 495-5004

A copy of the Emergency Response Plan will be sent to Admen Sergeant at the above address.

HAZARDOUS WASTE MANAGEMENT
JOB DESCRIPTION SCHEMATIC



4/5/01

Mark Williams

From: feedback@ic.grainger.com
Sent: Thursday, April 05, 2001 3:58 PM
To: Mark Williams
Subject: Grainger.com Order Confirmation

Dear Mark Williams:

Thank you for placing your order with Grainger.com! A summary of your order appears below. If you have any questions or changes, please contact branch 601 at 2223 S WILSON ST in TEMPE, Arizona 85282 at 480/966-9797. Our standard branch hou
rs are 8 am - 5 pm, Monday-Friday.

Thank you again. We look forward to serving you in the future.

The Web Team
Grainger.com

GRAINGER ORDER NUMBER: 000554692

Final Shipping Destination
First Name: Mark
Last Name: Williams
Company: METCO METAL FINISHING
FINISHING
Address: 3508 E. Corona Ave.
Address 2:
City: Phoenix
State: Arizona
Zip Code: 85040
Country: USA
Phone: 6022764120
Fax: 6022760109
mark@metcofinishing.com
E-mail: mark@metcofinishing.com

Contact Information
First Name: Mark
Last Name: Williams
Company: METCO METAL

Address: 3508 E. Corona Ave.
Address 2:
City: Phoenix
State: Arizona
Zip Code: 85040
Country: USA
Phone: 6022764120
E-mail:

Delivery Options
Shipping Method: Standard Shipping-UPS Ground
Account

Payment Information
Payment method: My Grainger

Account #: 814989422

Shipping Label/Packing List
P.O.#: 2866
Attention/Delivery Instructions: Mike Wilson

PRODUCT SELECTION

Qty	Item#	Description	UOM	Txble	Page	Price	Ext.Price
1	6HK33	Control Station	1	Yes	557	$40.42	$40.42
1	4A967	Vibrating Horn	1	Yes	2743	$92.38	$92.38

SUBTOTAL	$132.80
FREIGHT	$0.00
*TOTAL COST	$132.80

You have been given free freight for this order.
*Total Cost does not include any applicable tax charges.

All orders are subject to the Grainger Terms of Purchase.

Log In

User Name

go!

Enter your user name and password here.

Forgot your password?

Not registered yet?

Need help registering?

View Suggested Lists

Item Details

◀ Back to results

Grainger Item No. 4A967

Mfg. Model No. 350-120-30

Manufacturer FEDERAL SIGNAL

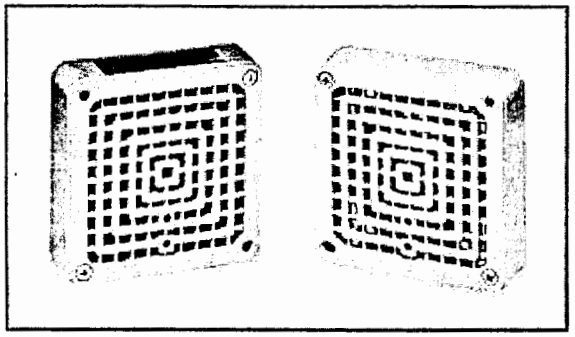
Unit of Measure 1

Description

Vibratone® Horn, 100 decibels at 10 feet, 120 volts AC, 60 Hertz Required Power, 0.18 Amps

Your Price $97.24

Price may not reflect the available price. **Log-in** to the left or click here to register.



☑ Select this item and enter a quantity. [ ] ADD THIS ITEM TO ORDER | Add this Item to Personal List

Your search yielded 1 possible product match. Here is the product that matches the search criteria you've entered.

Technical Specifications

Amperage:	0.18
Voltage:	120VAC, 60 Hz
Depth (In):	2 1/2
Height(In):	4
Signal Output(dB):	Horn, 100 dB 10 ft.
Width(In):	4
Type Of Signal:	Vibratone® Horn

In The Catalog

Category:
Safety & Security

Sub-Category:
Safety Equipment
Horns & Sirens

Catalog Page #:
View a listing of all items on page 2743

View Printable Page

Item Details

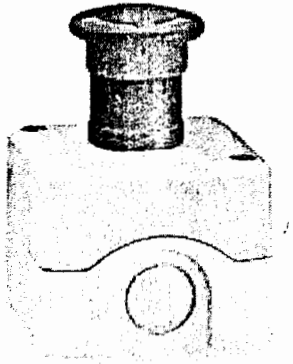
◀ Back to results

Grainger Item No.	**6HK33**
Mfg. Model No.	**XALK174**
Manufacturer	**Square D**
Unit of Measure	**1**

Description
Control Station, 40 Mm Mushroom, Turn to Release

Your Price **$42.55**

Price may not reflect the available price. **Log-In** to the left or click here to register.



Select this item and enter a quantity. ADD THIS ITEM TO ORDER | Add this Item to Personal List

Your search yielded 1 possible product match. Here is the product that matches the search criteria you've entered.

In The Catalog

Category:
Electrical

Sub-Category:
Electrical Supplies
Circuit Breaker Enclosures

Catalog Page #:
View a listing of all items on page 557

View Printable Page